

AMENDMENT TO THE CLAIMS

1-5. (canceled)

6. (currently amended) A method of generating a sentence from a semantic representation, the method comprising:

(A) mapping the semantic representation to an unordered set of syntactic nodes;

(B) using grammar rules from a generation grammar and statistical goodness measure values from a corresponding analysis grammar to create a tree structure to order the syntactic nodes, further comprising:

(B)(1) selecting a syntactic node to be a root node of a new syntactic tree;

(B)(2) identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically-derived attributes of the nodes, further comprising:

(B)(2)(i) identifying generation grammar rules that apply to a non-terminal leaf node at a current phrase level; and

(B)(2)(ii) identifying generation grammar rules that apply to the non-terminal leaf node at a lower phrase level which express the same semantic attributes as a rule at the current phrase level;

(B)(3) generating syntactic substructures described by each applicable rule and determining a statistical goodness measure value for each substructure; and

(B)(4) selecting the substructure with the highest statistical goodness measure value to use to expand the tree; and

(C) generating the sentence from the tree structure.

~~The method of claim 5, wherein step (B)(2) of identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically-derived attributes of the nodes further comprises:~~

~~(B)(2)(i) identifying generation grammar rules that apply to the non-terminal leaf node at the current phrase level; and~~

~~(B)(2)(ii) identifying generation grammar rules that apply to the non-terminal leaf node at a lower phrase level which express the same semantic attributes as a rule at the current phrase level.~~

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7-9. (canceled)

10. (currently amended) A method of generating a sentence from a semantic representation, the method comprising:

(A) mapping the semantic representation to an unordered set of syntactic nodes;

(B) using grammar rules from a generation grammar and statistical goodness measure values from a corresponding analysis grammar to create a tree structure to order the syntactic nodes, further comprising:

(B)(1) selecting a syntactic node to be a root node of a new syntactic tree;

(B)(2) identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically-derived attributes of the nodes;

(B)(3) generating syntactic substructures described by each applicable rule and determining a statistical goodness measure value for each substructure; and

(B)(4) selecting the substructure with the highest statistical goodness measure value to use to expand the tree, further comprising:

(B)(4)(i) creating a copy of the current tree for each generated substructure at a current phrase level;

(B)(4)(ii) adding each generated substructure to a tree created in (B)(4)(i); and

(B)(4)(iii) combining the statistical goodness measure of each generated substructure with the overall score of the tree to which it is added in (B)(4)(ii); and

(C) generating the sentence from the tree structure.

~~The method of claim 9, wherein step (B)(4) of selecting the substructure with the highest statistical goodness measure value to use to expand the tree further comprises:~~

~~(B)(4)(i) creating a copy of the current tree for each generated substructure at the current phrase level;~~

~~(B)(4)(ii) adding each generated substructure to a tree created in (B)(4)(i); and~~

~~(B)(4)(iii) combining the statistical goodness measure of each generated substructure with the overall score of the tree to which it is added in (B)(4)(ii).~~

11. (original) The method of claim 10, and further comprising selecting the highest scoring complete tree for generating the sentence.

12-16. (canceled)

17. (currently amended) A computer-readable medium having computer executable instructions for performing the sentence generating steps comprising:

- (A) mapping a semantic representation to an unordered set of syntactic nodes;
- (B) using grammar rules from a generation grammar and statistical goodness measure values from a corresponding analysis grammar to create a tree structure to order the syntactic nodes, further comprising:
 - (B)(1) selecting a syntactic node to be a root node of a new syntactic tree;
 - (B)(2) identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically-derived attributes of the nodes, further comprising:
 - (B)(2)(i) identifying generation grammar rules that apply to a non-terminal leaf node at the current phrase level; and
 - (B)(2)(ii) identifying generation grammar rules that apply to the non-terminal leaf node at a lower phrase level which express the same semantic attributes as a rule at the current phrase level;
 - (B)(3) generating syntactic substructures described by each applicable rule and determining a statistical goodness measure value for each substructure; and
 - (B)(4) selecting the substructure with the highest statistical goodness measure value to use to expand the tree; and
- (C) generating the sentence from the tree structure.

~~The computer readable medium of claim 16, wherein step (B)(2) of identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically derived attributes of the nodes further comprises:~~

- ~~(B)(2)(i) identifying generation grammar rules that apply to the non-terminal leaf node at the current phrase level; and~~
- ~~(B)(2)(ii) identifying generation grammar rules that apply to the non-terminal leaf node at a~~

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~~lower phrase level which express the same semantic attributes as a rule at the current phrase level.~~

18-20. (canceled)

21. (currently amended) A computer-readable medium having computer executable instructions for performing the sentence generating steps comprising:

- (A) mapping a semantic representation to an unordered set of syntactic nodes;
- (B) using grammar rules from a generation grammar and statistical goodness measure values from a corresponding analysis grammar to create a tree structure to order the syntactic nodes, further comprising:
 - (B)(1) selecting a syntactic node to be a root node of a new syntactic tree;
 - (B)(2) identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically-derived attributes of the nodes;
 - (B)(3) generating syntactic substructures described by each applicable rule and determining a statistical goodness measure value for each substructure; and
 - (B)(4) selecting the substructure with the highest statistical goodness measure value to use to expand the tree, further comprising:
 - (B)(4)(i) creating a copy of the current tree for each generated substructure at a current phrase level;
 - (B)(4)(ii) adding each generated substructure to a tree created in (B)(4)(i); and
 - (B)(4)(iii) combining the statistical goodness measure of each generated substructure with the overall score of the tree to which it is added in (B)(4)(ii); and
- (C) generating the sentence from the tree structure.

~~The computer readable medium of claim 20, wherein step (B)(4) of selecting the substructure with the highest statistical goodness measure value to use to expand the tree further comprises:~~

- ~~(B)(4)(i) creating a copy of the current tree for each generated substructure at the current phrase level;~~
- ~~(B)(4)(ii) adding each generated substructure to a tree created in (B)(4)(i); and~~
- ~~(B)(4)(iii) combining the statistical goodness measure of each generated substructure with the~~

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~~overall score of the tree to which it is added in (B)(4)(ii).~~

22. (original) The computer-readable medium of claim 21, and further having computer executable instructions for performing the step of selecting the highest scoring complete tree for generating the sentence.

23-26. (canceled)

27. (currently amended) A sentence generating system for generating a natural language sentence from an input semantic representation, the sentence generating system comprising:

a node mapper which maps the semantic representation to an unordered set of syntactic nodes;
a syntactic node orderer which uses grammar rules from a generation grammar and statistical goodness measure values from a corresponding analysis grammar to create a tree structure to order the syntactic nodes, wherein the analysis grammar includes lists of conditions for each grammar rule, and wherein the generation grammar is a simplified form of the analysis grammar which ignores all conditions from the analysis grammar except those directly related to semantic representation, wherein the syntactic node orderer creates the tree structure to order the syntactic nodes by performing the steps:

- (1) selecting a syntactic node to be a root node of a new syntactic tree;
- (2) identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically-derived attributes of the nodes, further comprising:
 - (2)(i) identifying generation grammar rules that apply to a non-terminal leaf node at a current phrase level; and
 - (2)(ii) identifying generation grammar rules that apply to the non-terminal leaf node at a lower phrase level which express the same semantic attributes as a rule at the current phrase level;
- (3) generating syntactic substructures described by each applicable rule and determining a statistical goodness measure value for each substructure; and
- (4) selecting the substructure with the highest statistical goodness measure to use to expand the tree; and

an inflection generator which produces an inflected form of leaf nodes in the tree structure and generates the sentence from the tree structure with the inflected form of the leaf nodes.

The sentence generating system of claim 26, wherein step (2), performed by the syntactic node orderer, of identifying generation grammar rules that apply to each leaf node in the tree, by testing rule conditions on semantically derived attributes of the nodes further comprises:

(2)(i) identifying generation grammar rules that apply to the non-terminal leaf node at the current phrase level; and

(2)(ii) identifying generation grammar rules that apply to the non-terminal leaf node at a lower phrase level which express the same semantic attributes as a rule at the current phrase level.

28-30. (canceled)

31. (currently amended) A sentence generating system for generating a natural language sentence from an input semantic representation, the sentence generating system comprising:

a node mapper which maps the semantic representation to an unordered set of syntactic nodes;

a syntactic node orderer which uses grammar rules from a generation grammar and statistical goodness measure values from a corresponding analysis grammar to create a tree structure to order the syntactic nodes, wherein the analysis grammar includes lists of conditions for each grammar rule, and wherein the generation grammar is a simplified form of the analysis grammar which ignores all conditions from the analysis grammar except those directly related to semantic representation, wherein the syntactic node orderer creates the tree structure to order the syntactic nodes by performing the steps:

(1) selecting a syntactic node to be a root node of a new syntactic tree;

(2) identifying generation grammar rules that apply to each non-terminal leaf node at a current phrase level in the tree, by testing rule conditions on semantically derived attributes of the nodes;

(3) generating syntactic substructures described by each applicable rule and determining a statistical goodness measure value for each substructure; and

(4) selecting the substructure with the highest statistical goodness measure value to use to expand the tree, wherein selecting the substructure with the highest statistical

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goodness measure value further comprises:

(4)(i) creating a copy of the current tree for each generated substructure at a current phrase level;

(4)(ii) adding each generated substructure to a tree created in (4)(i); and

(4)(iii) combining the statistical goodness measure of each generated substructure with the overall score of the tree to which it is added in (4)(ii); and

an inflection generator which produces an inflected form of leaf nodes in the tree structure and generates the sentence from the tree structure with the inflected form of the leaf nodes.

The sentence generating system of claim 30, wherein step (4), performed by the syntactic node orderer, of selecting the substructure with the highest statistical goodness measure value to use to expand the tree further comprises:

(4)(i) creating a copy of the current tree for each generated substructure at the current phrase level;

(4)(ii) adding each generated substructure to a tree created in (4)(i); and

(4)(iii) combining the statistical goodness measure of each generated substructure with the overall score of the tree to which it is added in (4)(ii).

32. (original) The sentence generating system of claim 31, wherein the inflection generator generates the sentence from the tree structure by selecting the highest scoring complete tree.